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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/980,956 | 06/25/2002 | Donald Jafrey | A-71184/DJB/MAK | 3450 |

7590 03/25/2005

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EXAMINER

CREPEAU, JONATHAN

| | |
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| ART UNIT | PAPER NUMBER |
|----------|--------------|

1746

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|---------------------|-----------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/980,956 | JAFFREY, DONALD | |
| | Examiner | Art Unit | |
| | Jonathan S. Crepeau | 1746 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 21-25 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>6/26/02</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Suggestions

1. In claims 3, 4 and 23, the “preferably” clauses could be deleted or amended to increase the clarity of the claims. Appropriate correction is suggested but not required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 6, 7, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by DE 19523637. The reference is directed to a separator plate capable of being used in a fuel cell. The plate comprises a steel substrate (1), a diffusion barrier (2) comprising a layer of copper (see top of page 5 of machine translation), and a corrosion protection layer (3). The steel of layer (1) is inherently oxidation resistant and is preferably adjacent the cathode of the fuel cell while the corrosion protection layer is preferably adjacent the anode (see page 3, approx. line 35 of translation).

Thus, the instant claims are anticipated.

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4. Claims 1, 5, 6, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Badwal et al (WO 96/28855 or US 5,942,349). The '349 patent is directed to a fuel cell interconnect device comprising a plate (34). The plate comprises a chromium-containing substrate, a chromia protection layer thereon, and a metal oxide layer on the surface of the chromia. The chromia layer may comprise copper (see col. 4, line 45) and is thus considered to read on the "layer of copper" recited in claim 1. The metal oxide layer is oxidation resistant and is adjacent the cathode of the fuel cell (see col. 4, line 23). The layer further has a thickness of 1-100 microns (see col. 4, line 17).

Thus, the instant claims are anticipated.

5. Claims 1, 6, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 60-154470. In the Derwent citation, the reference teaches a separator comprising aluminum or copper plated with titanium carbide. TiC is an inherently oxidation-resistant material. Based on the Figure, the separator appears to be coated on both the cathode and anode sides with TiC.

Thus, the instant claims are anticipated.

6. Claims 1, 2, 4, 6, 11-14, 17-19, and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Shinoda et al (U.S. Patent 4,873,149). The reference is directed to vibration-

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damper metal sheets. Such sheets are capable of use as separator members in fuel cells (the preambles of the claims being directed to a future intended use). Regarding claims 1 and 21, the sheet comprises two sheets of aluminum bronze connected together (see col. 17, line 15). The aluminum bronze comprises 8.1 wt% Al (see Table 27). The finished metal sheet has a thickness of 1.6 mm and is further annealed at 750C (see col. 17, line 35). Therefore, an alumina layer would inherently be formed on the sheet as recited in claim 24. Regarding claims 1 and 14, such alumina would be formed on both sides of the sheet. Regarding claims 6, 11, and 17, the alumina is also considered to be a "coating." Regarding claims 12, 13, 18, and 19, the limitations of these claims are considered to be process limitations and are accorded little patentable weight (MPEP §2113).

Thus, the instant claims are anticipated.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 60-154470.

The reference is applied to claims 1, 6, and 14 for the reasons stated above. However, the abstract of the reference does not expressly teach the thicknesses of the copper layer or TiC layer

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as recited in claims 2, 3 and 5, or that the separator comprises a copper-based alloy comprising Al in an amount of 50 wt% or less, as recited in claim 4.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be sufficiently skilled to manipulate the thicknesses of either the Cu plate or the TiC coating to affect characteristics such as electrical resistance and strength. It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980). As such, the claimed thickness ranges are considered to be obvious to the skilled artisan.

Regarding claim 4, this claim recites that Cu is alloyed with another element selected from Al, among others. The abstracts of the JP reference disclose that the plate can be made of copper or aluminum. The courts have held that it is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition which is to be used for the very same purpose. *In re Kerkhoven*, 205 USPQ 1069 (CCPA 1980). As such, the combination of the aluminum and copper, at a nominal composition such as 50/50, would be rendered obvious.

9. Claims 8, 9, 10, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE 19523637 in view of WO 99/13522.

DE '637 is applied to claims 1, 6, 7, and 14 for the reasons stated above. However, the reference does not expressly teach that the steel layer comprises an alumina layer thereon, as recited in claims 8, 9, 15, and 16.

WO '522 is directed to a fuel cell interconnector. As set forth on page 6, line 6 et seq., the reference teaches that the main body of the interconnector is made of a heat-resisting steel comprising aluminum in a high enough amount to form alumina on the surface of the steel at cell operating conditions, or is coated with a protective coating of alumina.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the heat-resistant steel of WO '522 as the steel layer of DE '637, or to coat the steel layer of DE '637 with a layer of alumina. At page 6, line 12, WO '522 discloses that this treatment renders the surface impervious to oxygen and chromium-oxide based gases. As such, the artisan would be motivated to use the heat-resistant steel of WO '522 as the steel layer of DE '637, or to coat the steel layer of DE '637 with a layer of alumina to achieve oxidation resistance. Furthermore, the open face of the layer (1) in DE '637 could subsequently be adjacent to either the cathode or the anode of the fuel cell, thereby rendering these limitations obvious.

Allowable Subject Matter

10. Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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11. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 20, none of the applied references teach or fairly suggest plural layers comprising the claimed materials on the layer of copper or copper-based alloy.

Conclusion

12. The following notes are made with respect to the references cited in the International Search Report which bear an "X" label that were not applied above:

The abstract of JP 9-157001 does not anticipate claim 1 because it does not disclose a separate oxidation-resistant layer on the surface of the copper-containing layer.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau
Primary Examiner
Art Unit 1746
March 18, 2005